Introduction to Cloud Computing

Cloud computing delivers computing services over the internet. It enables faster innovation, flexible resources, and economies of scale.

Key Characteristics of Cloud Computing

On-Demand Self-Service

Users provision computing resources automatically without human interaction.

Broad Network Access

Services are accessible over the network via standard mechanisms.

Resource Pooling

Provider resources are pooled to serve multiple consumers efficiently.

Rapid Elasticity

Resources scale quickly outward and inward based on demand.

Measured Service

Resource usage is monitored and reported for transparency.

Types of Cloud Services

Infrastructure as a Service (IaaS)

Virtualized computing resources like servers and storage rented online.

Example: AWS EC2

Platform as a Service (PaaS)

Tools for developing and managing applications without infrastructure worries.

Example: Google App Engine
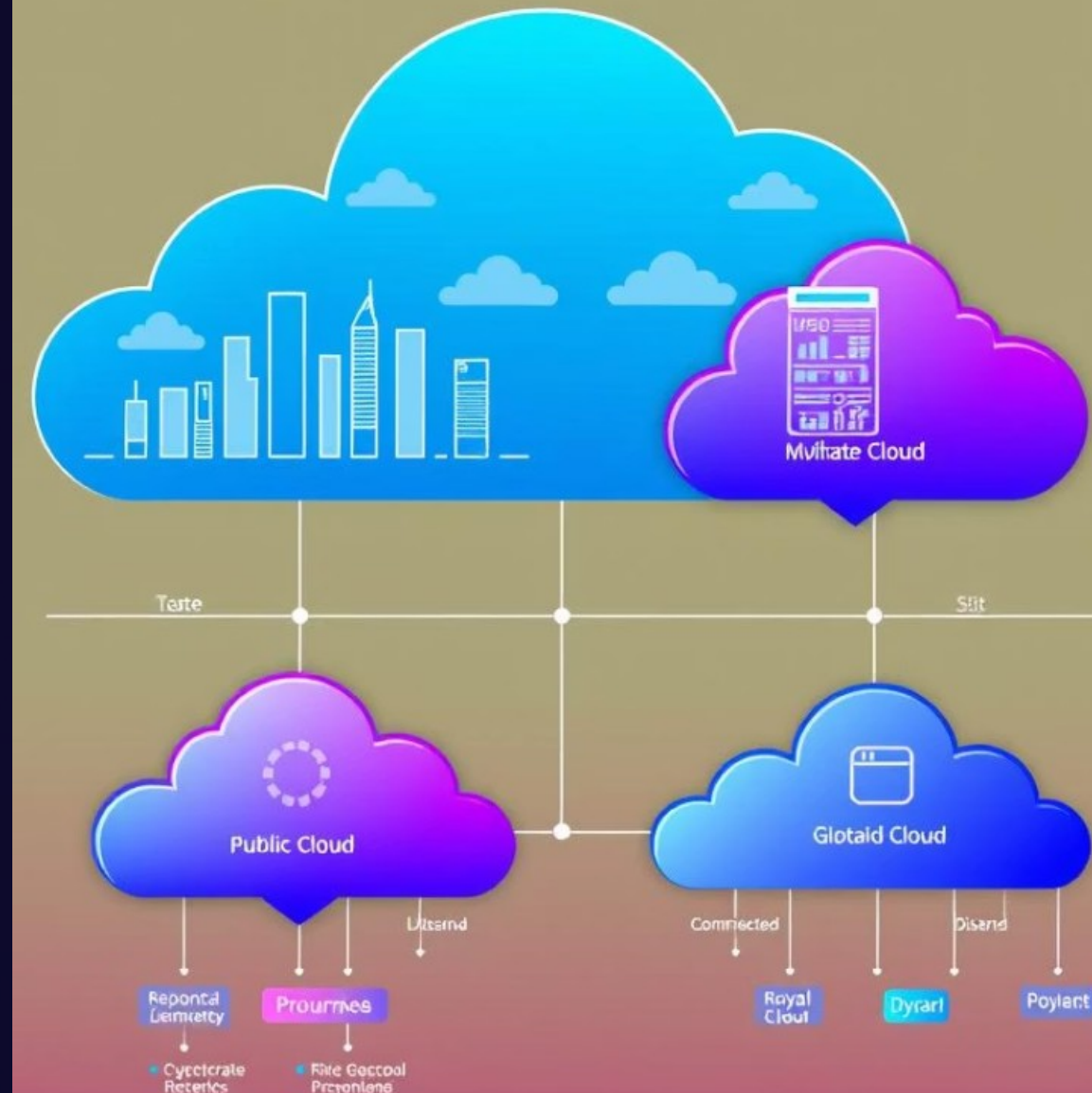
Software as a Service (SaaS)

Software accessed online on a subscription basis, no installation needed.

Example: Microsoft Office 365

Cloud Deployment Models Overview

- **Public Cloud**

  Shared services over the internet, cost-effective and scalable.

- **Private Cloud**

  Dedicated infrastructure offering enhanced control and security.

- **Hybrid Cloud**

  Combines public and private clouds for flexibility and optimization.

- **Multi-Cloud**

  Uses multiple providers to avoid vendor lock-in and increase resilience.

Public Cloud Details

Public clouds are cost-effective and scalable. Ideal for variable workloads.

However, shared infrastructure may not suit sensitive data needs.

Private Cloud Details

Private clouds offer enhanced security and control for strict compliance.

They involve higher costs and maintenance responsibilities.

Hybrid Cloud Benefits

Hybrid clouds balance security and scalability by combining private and public clouds.

This model optimizes infrastructure and resource use.

Multi-Cloud Strategy

Multi-cloud avoids dependency on one provider, enhancing resilience.

Managing multiple providers increases complexity but improves flexibility.